

Amendment, GAU 2835, Ser. No. 10/077,857

REMARKS

Claim 1 was pending in this application. New claims 2-7 are added.

The new claims are supported in the drawing and in the specification, mostly in the paragraph starting at page 9, line 21. In response to the Office Action:

Claim 1 was rejected under 35 U.S.C. §102, as being anticipated by Hileman, U.S. Patent 6,052,285. This rejection is respectfully traversed.

The claimed invention includes a heat sink 1100 comprising a heat pipe 61 that extends from a front surface 162 of a motherboard 160 via a through hole 166 to a back surface 164 of the motherboard 160. The heat pipe 61 is coupled with exoergic elements, such as electronic components, mounted with the motherboard 160. The present invention cools both sides of the motherboard 160 using the heat pipe 61 and the through hole 166 in the motherboard 160.

Hileman discloses a radiation mechanism comprising a printed circuit board 14 having an opening 39 and a heat pipe 26. An evaporator end 30 of the heat pipe 26 connects to an integrated-circuit package 18 mounted to a printed circuit board 20, via a heat spreader 28, and cools the printed circuit board 20.

Therefore, while the Applicant's mechanism cools both sides of the motherboard 160 using the through hole 166, Hileman cools the printed circuit board 20 without using the opening 39. Further, Hileman's radiation mechanism cannot cool both sides of the printed circuit board 20.

Hileman does not disclose the limitation in claim 1, "a heat pipe disposed between said front surface and said back surface of said board, via said through hole." Because of this, Hileman cannot achieve the advantages of the presently-claimed mechanism.

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Withdrawal of the rejection is requested.

The new claims are patentable for the reasons below.

Claim 2 recites that the heat pipe runs parallel to the front surface and to the back surface of the board. In Hileman, the heat pipe 26 does *not* run parallel to board 14, which is the only board that has a hole and therefore is the only board that could anticipate the claimed "board ... including a through hole."

Regarding claim 3, Hileman' heat sink does not comprises a cooling fan disposed above the through hole 39. No fan is seen; moreover, *nothing* could be disposed there, because the heat pipe 26 (and/or the manifold 38) is already above the through hole 39. Claim 4 is still further distinguishes over Hileman, since if Hileman discloses no fan it certainly cannot disclose a fan axis orientation.

Claim 5 is also contrary to Hileman. If a cooling fan were provided (not suggested) and it blew air in a direction parallel to said front surface of the board 14, the air would not flow over the heat sink. And Hileman dicloses no fan-cum-heat sink unit as is recited in claim 6.

Claim 7 is like claim 2 and is patentable for the same reasons.

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In view of the aforementioned amendments and accompanying remarks, the claims are believed to be in condition for allowance, which is requested. If this paper is not timely filed, then it is a petition for an appropriate extension of time. Any additional fees needed for this paper may be charged to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Version With Markings to Show Changes

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office (Fax No. (703) 872-9318) on November 21, 2002.

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